Understanding Urban Farm Households Vulnerability to Economic Shocks in South-South Nigeria

Ubokudom E. Okon[1], Kesit K. Nkeme[1], Ubon A. Essien[2] and Chukwuemeka C. Onyia[3]

[1]*Department of Agricultural Economics and Extension, Akwa Ibom State University, Obio Akpa campus, Uyo.*
[2]*Department of Agricultural Economics, School of Agriculture and Agricultural Technology, Federal University of Technology, Owerri, Nigeria*
[3]*Department of Agricultural Economics, University of Nigeria Nsukka, Enugu State, Nigeria.*

High level of vulnerability of urban farmers to economic shocks occasioned by variability in climate often hampers their effective participation in economic activities. Previous attempts at improving the wellbeing of households in Nigeria were often concentrated in rural areas and tended to ignore resource poor households in urban areas. Also, lack of information on the vulnerability status of urban households often limit their effective participation in economic activities. This study assessed the vulnerability status of urban farmers in South-south region of Nigeria. Data for this study was obtained from two hundred and eighty nine (289) households that were randomly selected from three States in South-south Nigeria and analyzed using vulnerability index analysis. The results indicated that the vulnerability of urban farmers in the area is caused by lack of access to formal credit (0.95), lack of access to land (0.86), low asset value (0.82), loss of primary income earner (0.81), loss of productive asset (0.73), low farm income (0.71), high dependent population and low level of education (0.69). Also, households that were totally dependent on farm income were 66% more likely to be vulnerable to economic shocks. The study shows the economic vulnerability of urban farmers is high and recommends capacity building, provision of formal credit and provision of land in cities for urban agriculture.

Key Words: Economic shocks, Urban farmers, Vulnerability, Nigeria

Background Information

Rapid urbanization has challenged the world with the threesome problems of eliminating hunger, under nourishment and overcoming poverty especially for the urban poor and vulnerable groups of the society. It is expected that by 2050, two thirds of the world will be living in urban areas, with urban population continuously outgrowing the rural. Also, the United Nation Habitat articulates that cities in developing countries will absorb ninety five percent of urban growth in the next two decades (UN-Habitat, 2015). Consequently, instability in food availability and commodity price spike will impact largely on the livelihood of the urban poor and food-insecure people (von-Braun, 2007).

In the past few decades, except for the sub-Saharan African regions, urbanization most often accompanied by economic growth has been one of the defining features of our time. Urbanization has brought about lofty standards of living. This is a reason of the benefit of economics of scale that accrues from highly populated urban centers which makes them more productive. As the world tends towards the direction of urbanization, it is of cogent concern to ensure the food security of the poor urban dwellers. Further, in the whole of African continent the urban population is projected to triple in the next half century, thereby transforming the profile of the region. This transition presents a challenge to policy makers to take advantage of urbanization phenomenon for an inclusive and sustainable growth and development.

For the sub-Saharan African countries, especially Nigeria this paradigm shift implies that the challenge of urban poverty, urban food insecurity, and unemployment which was estimated to be 12.1% of economically active population (NBS, 2016), will become more pronounced. Sub- Saharan Africa has the highest percentage of population of hungry people in the world, one person in four is undernourished (FAO, 2015).

Corresponding author: Ubokudom E. Okon PhD, Akwa Ibom State University, Uyo, Nigeria. Email: ubokudomokon@aksu.edu.ng

Also, available statistics indicate that Nigeria has over 12 million people in a state of hunger and this can trigger vulnerability to even the slightest shocks to food supply (FAO, 2016). Additionally, the drop in Nigeria's oil prices and government policies has combined to erode the purchasing power of the average Nigerian, impacting negatively on their livelihoods (Okon, Enete & Okorji, 2017).

Amidst these challenges, urban households have turned to some economic activities and/or coping strategies to alleviate these problems. Potts (1997) distinguished two major coping strategies of urban households: multiple cash incomes and urban agriculture (UA – which is simply the growing of crops and rearing of animals within and around cities (RUAF, 2007). Urban agriculture plays a key role in ensuring the food security, income, and nutritional status of the urban dwellers by availing them direct access to availability of fresh and locally produced foods, and also offering employment opportunities (FAO, 1999). Urban Agriculture is increasingly becoming realized in many developing countries as an important livelihood activity contributing significantly to household livelihood system and the urban economy. Furthermore, Korr, Rotch and Pacifica (2015) highlighted the importance of UA as one of the means of ensuring the availability of food and enhancing access to food in urban area thereby contributing to their food security and wellbeing.

There is a continuous growing interest in the practices of UA, as reflected in its essentiality as a priority research and policy issue on the international development agenda (Ellis & Sumbery 1998; Mougeot, 2011). Urban agriculture (UA) constitutes a significant source of livelihoods, especially for the urban poor in Nigeria, since more than 30% of their household income originates from this activity (Zezza & Tasciotti, 2010). In urban settings, lack of incomes translates more directly into lack of food than in rural settings. In this case, the urban dwellers need cash to purchase their basic needs, but they oftentimes have limited or no money to purchase these basic needs, making them vulnerable to economic shocks. The urban poor in low-income countries are among the food insecure and vulnerable groups. Their food expenditures accounts for a large share of their total income, thereby making them vulnerable to fluctuations in food prices (Zezza, Azzarri, Covarrubias, Nono-Womdim, & Giaanquito, 2013). Most urban households face significant challenges in carrying out their economic activities as a result of their vulnerability to variations in their socio-economic circumstances as well as lack of assets. It is imperative to reduce vulnerability to both assets and socio-economic risks among poor urban households to ensure that they continuously engage in productive activities as well as take advantage of new opportunities (Farrington et. al., 2007).

Vulnerability measures the extent to which a system of units is likely to experience harm due to exposure to perturbations or stress (Sherbinin et. al., 2007). Vulnerability in a general sense is an ongoing dynamic concept evolving each individual as events occur and risks responses and output change, not just as a function of the environment a person's lives. It is the product of risks of the person's conditions and also of his or her actions. It represents households or individuals exposure to future loss due to a shock which causes the individuals wellbeing to fall below a given socially acceptable level. Vulnerability is an anticipatory measure of households' wellbeing (Chaudhury, 2001). Adeoti & Singh (2009) observed that vulnerability is a state of being open to shocks that disrupts economic life.

Since the poor households who are susceptible to economic, political and environmental risk usually lack buffers, reducing vulnerability to shocks among the poor is therefore necessary in poverty alleviation (Adeoti & Sing, 2009). In view of the interrelationships between social protection programmes, agricultural growth, effective poverty reduction and food security, it is imperative that issues affecting vulnerability measures are integrated into policy programme design and implementation.

However, the existence of in-depth information on the vulnerability status of urban farm households to economic shocks in South South Nigeria is vague, hence the need for this study. Vulnerability is determine by the characteristics of the shocks and households ability to respond to the shock. In this regard, it is clear that urban farmers in developing nations may lack assets that otherwise could be used to generate income as these could make them more susceptible to economic shocks. This study aimed to give an insight into the level of vulnerability to economic shocks among urban farm households in South-South Nigeria.

Materials and Methods

The Study Area

Nigeria lies between latitudes 4^0 and 14^0 N and longitudes 3^0 and 14^0 E, covering a land area of about $92,000km^2$ with a population of about 150 million people (NPC, 2006). The study was carried out in the South-South geopolitical zone of Nigeria, which is strategically located at the point where the river Niger joins the Atlantic Ocean through the gulf of guinea. The South-South region is made up of six out of the 36 States of the federal republic of Nigeria. The six States

are Akwa Ibom, Bayelsa, Cross River, Edo, Delta and Rivers States. The South-South region has a total population of 21,034,081 people (NPC, 2006). South-South is the core oil producing area which provides the economic mainstay of the country: oil and gas. In addition to oil and gas, the region equally contributes other key resources, with potential huge opportunities in tourism and agriculture. It has an average annual rainfall of 1,200 to 2,500mm (NIMET, 2012). The climate of the area allows for favourable cultivation and extraction of agricultural and forest products such as palm produce, rubber, cocoa, cassava, yam, plantain, banana, maize, vegetables, timber etc. Majority of the inhabitants are farmers, practicing farming and other enterprises such as crop production, livestock breeding, forestry practices, fisheries, aquaculture, agricultural processing as well as urban commerce and transport business.

Sampling Procedure

This study employed multistage and simple random sampling techniques in selecting the respondents. Three (3) out of the six States in the South-South geographical zone were randomly selected, namely: Akwa Ibom, Cross River and Delta States. Three of the State capitals were purposively selected (namely, Uyo, Calabar and Asaba), since the study is on urban agriculture. Three additional towns classified as urban from Nigerian living Standard survey were randomly selected from each of the selected States, namely; Ikot Ekpene, Ikom and Warri from Akwa Ibom, Cross River and Delta States respectively, making a total of six urban areas. Lists of urban farmers were obtained from the State Agricultural Development Programme offices. Eighty households were randomly selected from each of the three selected State capitals, while twenty households were randomly selected from each of the additional towns in the State, all in proportion to the population of the cities. This gave a sample size of three hundred households (100 from each State). However, data from Delta State were less than 100 due inconsistencies by some respondent in filling/returning of some questionnaires. After data cleaning, 89 questionnaires were considered appropriate for analysis from Delta State. This gave effective sample size of 289 respondents.

Method of Data Collection

Data for this study were obtained mainly from primary sources using structured questionnaires administered by the researcher and trained enumerators to cover the three selected States. The estimation of vulnerability in the study was done using asset capacity approach. The data focused on the following: household composition and other socio-economic data of the respondents, namely: asset value and level of productive assets, membership of organizations, loss of primary income earner and household vulnerability to shocks. This study disaggregates households into two categories: (i) Farm income dependent and (ii) Non-farm income dependent household.

Data Analysis

Data collected were analyzed using descriptive statistics such as percentages, frequencies, bar charts, means and standard deviations as well as vulnerability index analysis. The estimation of household vulnerability to economic shocks was done using asset capacity approach. Table 2 and figure 1 shows vulnerability analysis of the respondents. The vulnerability indicators assessed in this study include: years of formal schooling (education), land ownership status of the farmer, asset value, access to loan, access to remittance to support farming, total farm income, membership of social organizations, loss of primary income earners in the last five years, loss of productive asset in the last five years, and number of adult members of household. It is assumed that most of these factors either reduces or increases respondents' vulnerability to economic shocks. As presented in Table 2, the actual values of the asset base indicators are in different units and scales. To obtain the vulnerability indices on each of the indicators, the methodology used by United Nations Development Programme (UNDP) (2006) for assessing Human Development Index was followed to normalize and standardize the values to lie between 0 and 1. A value less than 0.5 implies that the household is not vulnerable to economic shocks, while value greater than 0.5 indicates that the household is vulnerabile to economic shocks. The most preferred and natural candidate for the vulnerability threshold is 0.5. This midway dividing point has an attractive feature, it makes intuitive sense to say a household is 'vulnerable' if it faces a 50% or higher probability of falling into poverty in the near future. The underlying logic is that "the observed poverty rate represents the mean vulnerability level in the population, anyone whose vulnerability level lies above this threshold faces the risk of poverty that is greater than the average risk in the population and hence can be legitimately be included among the vulnerable" (Chaudhuri, 2003). In practice, therefore most of the empirical studies adopted the vulnerability threshold of 0.5.

Household Vulnerability Analysis

Vulnerability Index (VI) Analysis

To assess household's vulnerability to economic shocks, vulnerability analysis was employed. For each component of vulnerability, the data collected were then arranged in the form of a rectangular matrix with rows representing households' major income activity and columns representing asset capacity indicators. Thus, vulnerability is potential impact (*I*) minus income generating capacity (*IC*). This leads to the following mathematical equations for vulnerability.

$$V = f(I - IC) .... (1)$$

Income generating activities		Indicators of Vulnerability				
		1	*2*	.	.	*K*
Farm income (f)		*Xf1*	*Xf2*	.	.	*Xkm*
Non- farm income (n)		*Xn1*	*Xn2*	.	.	*Xkf*

The obtained figures from all the estimated indicators as used in the study are normalized to be free from their respective units so that they all lie between 0 and 1. The household with the higher value corresponds to high vulnerability and *vise versa*. Hence, the normalisation is achieved with this formular following (UNDP, 2006):

$$y_{ij} = \frac{Max\{Xfi\} - Xfi}{Max\{Xfi\} - Min\{Xfi\}} .... (2)$$

Where: *Xfi* represents the value of the indicator 1 for an income generating activity.
        f represents farm income.
Max & *Min* represent maximum and minimum values of indicators respectively.

When equal weights are given for the vulnerability indicators, simple average of all the normalized scores is computed to construct the vulnerability index using:

$$VI = \frac{\sum x_{f1} + \sum x_{fk}}{K} .... (3)$$

VI = represent the vulnerability indicator
K = represents the number of indicators used
After normalization, the average index (AI) for each source of vulnerability was worked out and then the overall vulnerability index was computed by employing the following formula:

$$VI = \left\{ \sum_{i-1}^{n} x_{f1} (AI_i)^{\alpha} \right\}^{1/\alpha} \Big/ n .... (4)$$

Where *n* is the number of sources of vulnerability and *α = n*. The vulnerability indicators that were used in this study include:
X_1 = Years of Formal Education (in years)
X_2 = Ownership of land (dummy, 1= owned land, 0 = otherwise)
X_3 = Value of productive assets owned (in Naira).
X_4 = Access to formal credits or loan (dummy, 1 if accessed loan, 0 =otherwise)
X_5 = Remittance (the amount of money (in Naira) received by the household within the past three years)

X_6 = Total farm income (in Naira)
X_7 = Membership of organization (Number of organisations)
X_8 = Loss of primary income earner (dummy, 1= if loss, 0 = otherwise)
X_9 = Loss of productive asset (dummy, 1= if loss, 0 = otherwise)
X_{10} = Dependent members of the household (number of household members < 15 and > 65 years of age)

Results and discussion

Urban farm households' vulnerability to economic shocks in the study area

Households face different kinds and magnitude of risk that may lead to a wide variation in their income generating capacity from year to year including loss of productive assets (Alayande & Alayande, 2004). When there are not enough assets to reduce shocks or risk to livelihood, household sometimes may experience losses including reduction in quality and quantity of nutritious food intake; or sometimes school-aged children can temporally or permanently stop schooling (Osawe, 2013), this could reduce household human capital base, thereby making them vulnerable to economic shocks.

In Table 1, using educational level of the household heads as an indicator, farm income dependent households in the surveyed area had vulnerability index of 0.69 while non-farm income dependent households had vulnerability index of 0.20. The implication of this finding is that farm income dependent households are 69% vulnerable to economic shocks, while their non-farm income dependent counterparts were not vulnerable. It could also mean that farm income dependent household had low educational qualifications which could deny them opportunities to be employed in more remunerative jobs, which otherwise could assist them to cope with economic shocks. It is worthy to note that poverty and vulnerability diminishes as we move up the education ladder (Osawe, 2013). Education can affect people's standard of living through a number of channels: it helps skill formation resulting in higher marginal productivity of labour that eventually enables people to engage in more remunerative jobs. Highly educated people may have better coping abilities against future odds. Indeed, educated people may adapt more easily to changing circumstances, therefore showing greater ex-post coping capacity (Christiansen & Subbarao, 2005).

Considering land ownership status, farm income dependent households had vulnerability index of 0.86, suggesting 86% vulnerability, while non-farm income dependent households were not vulnerable (0.31). This implies that non-farm income dependent households' had more access to land than their counterparts. This is not unconnected to the high educational level of non-farm income dependent households which might have given them the financial empowerment to purchase land, and this made them less vulnerable to economic shocks.

In terms of asset value, farm income dependent households had vulnerability index of 0.82 suggesting high vulnerability while the non-farm income dependent households had a vulnerability index of 0.53 suggesting that all the respondents were vulnerable to economic shocks. Households that have low asset value are more likely to be poor and have higher level of vulnerability (Bebbington, 1999).

Access to formal credit as a vulnerability indicator, farm income dependent households were 95% vulnerable with vulnerability index of 0.95 while non-farm income dependent household were not vulnerable (0.38). The explanation on educational level above could also apply here. It could also mean that non-farm income dependent households (who are more educated) might have gotten financial resources through collaterals to secure loan. This is to be expected because access to financial resources reduces vulnerability and poverty. This results lend credence to the findings of Gaiha & Imai (2006), who asserts that lack of access to formal credits could make households vulnerable to unexpected income shocks or fluctuations in income streams.

Remittance appears to make a difference in households' living standards. Household receiving remittances fare much better that household not receiving any remittance. The survey shows that both farm (51%) and non-farm income (91%) dependent households were vulnerable to economic shocks. This could mean that only few households received remittances.

Interestingly, in the case of total farm income, the vulnerability index of farm income dependent households was 71% while that of non- farm income dependent household was 13%. It could mean that for households that depends totally on farm income, a greater proportion of their farm produced was for home consumption instead of selling for income, this made them more vulnerable to economic shocks. Although producing for home consumption could reduce food insecurity among households, but they may not have sufficient cash to save for the rainy day, hence, this made farm income dependent households most vulnerable.

Vulnerability threshold on membership of organizations indicates that both respondents were not vulnerable. However, the farm income dependent households had relatively lower vulnerability (17%) than their non-farm income counterpart (47%). This could mean that farm households who depends on farm income as their major income source, had more social ties than their counterparts.

Loss of primary income earner as a vulnerability indicator shows that, farm income dependent households were 80% vulnerable while their non-farm income counterpart were not vulnerable with (23%). It could mean that, loss of primary income earner among the farm income dependents households may drive the respondents to urban farming activities. In addition,

loss primary income earner per family further exacerbates vulnerability when faced. Le Breton & Brusati, (2001) observed that loss of primary income earner (parents) increases child labor, increases risk of engaging in risky livelihood strategies; such as living and working on the streets; working children are exposed to increase risk of sexual abuse at work. Also, loss of primary income earner (especially male household heads) may put households in a disadvantaged position in terms of access to land, livestock and other tangible assets (Thabane, 2015).

Considering loss of productive assets, the vulnerability indicator reveals that farm income dependent households were 73% likely to be vulnerable while their counterparts were not vulnerable (38%). This could likely suggest that farm income dependent household lost most of their productive assets either due to urban expansion, eviction from unsecured land or government policies. Vulnerability analysis on number of adult members of the household suggests that non-farm income dependent households were 71% vulnerable, while their farm income dependent counterparts were not vulnerable 41%. The implication of this finding is that non-farm income dependent household could have more dependent population than their counterpart, which could make them vulnerable to economic shocks. Whitehead (2002) noted that households with

more adult members had lower vulnerability and poverty status than those with few adult members.

A cursory look at the vulnerability indicator among farm and non-farm income dependent households, suggests high level of vulnerability among farm income dependent households (66%), while non-farm income dependent households (42%) were not vulnerable. The vulnerability of farm income dependent households is not surprising, since agriculture is a seasonal activity, and is most vulnerable to weather and climatic changes. IIiya (1999) noted that the major income source of the household can be crucial in determining vulnerability because seasonal activities like farming can be a treat to livelihood when household is exposed to a potentially devastating adverse situation such as weather fluctuation resulting to drought, crop failure, debt etc.

The State based analysis suggests that Cross River and Delta States respondents were vulnerable with 68% and 57% level of vulnerability respectively, while Akwa Ibom State respondents were not vulnerable (39%). This suggests that Akwa Ibom could have more assets than other two surveyed States. The mean vulnerability index was 0.55, suggesting that the surveyed urban farm households in South-south Nigeria are 55% more likely to be vulnerable to economic shocks.

Table 1: Vulnerability level (Vulnerability Index) of the respondents

SN	Sampled States / Vulnerability Indicators	Activity income	Akwa Ibom Actual Value	Vul. Index	Cross River Actual Value	Vul. Index	Delta Actual Value	Vul. Index	Average Actual Value	Vul. Index
X1	EDUCATION	Farm	14.68	0.34	12.00	1.00	13.08	0.73	13.25	0.69
		Non-farm	16.04	0.00	13.94	0.51	15.57	0.11	15.18	0.20
X2	OWNERSHIP OF LAND	Farm	0.10	1.00	0.18	0.88	0.30	0.71	0.19	0.86
		Non-farm	0.79	0.00	0.61	0.26	0.38	0.67	0.59	0.31
X3	ASSET VALUE	Farm	530566	0.46	366200	0.99	363160	1.00	419975	0.82
		Non-farm	673771	0.00	390925	0.91	460512	0.68	508402	0.53
X4	ACCESS TO CREDIT	Farm	0.19	1.00	0.24	0.93	0.26	0.91	0.23	0.95
		Non-Farm	0.93	0.00	0.60	0.45	0.41	0.70	0.65	0.38
X5	REMITTANCE	Farm	60800	0.59	23083	0.93	127167	0.00	70348	0.51
		Non-Farm	14960	1.00	38015	0.79	24800	0.91	25925	0.90
X6	TOTAL FARM INCOME	Farm	891840	0.41	460077	1.00	651148	0.73	450639	0.71
		Non-farm	1193420	0.00	992865	0.27	1101953	0.12	1096079	0.13
X7	MEMBERSHIP OF ORGANISATIONS	Farm	0.80	0.13	0.69	0.39	0.86	0.00	2.3499	0.17
		Non-farm	0.42	1.00	0.72	0.32	0.81	0.11	1221	0.47
X8	PRIMARY INCOME EARNER	Farm	0.20	1.00	0.40	0.39	0.20	1.00	0.27	0.80
		Non-farm	0.45	0.24	0.53	0.00	0.38	0.45	0.45	0.23
X9	PRODUCTIVE ASSET (loss)	Farm	55850	0.42	25648	0.81	12579	0.98	31359	0.73
		Non-Farm	89010	0.00	11405	1.00	77078	0.15	59164	0.38
X10	DEPENDENT POPULATION	Farm	3.22	0.00	2.45	0.88	2.89	0.38	2.85	0.42
		Non-Farm	2.98	0.28	2.47	0.86	2.35	1.00	2.60	0.71
	MEAN VULNERABILITY INDEX			0.39		0.68		0.57		0.55

Computed from field survey data: 2016.
Farm Income dependent household =0.66
Non- Farm Income dependent household =0.42
Overall vulnerability index = 0.55

The overall vulnerability index of 0.55 is an indication that urban farm households in South-South Nigeria are vulnerable to economic shocks.
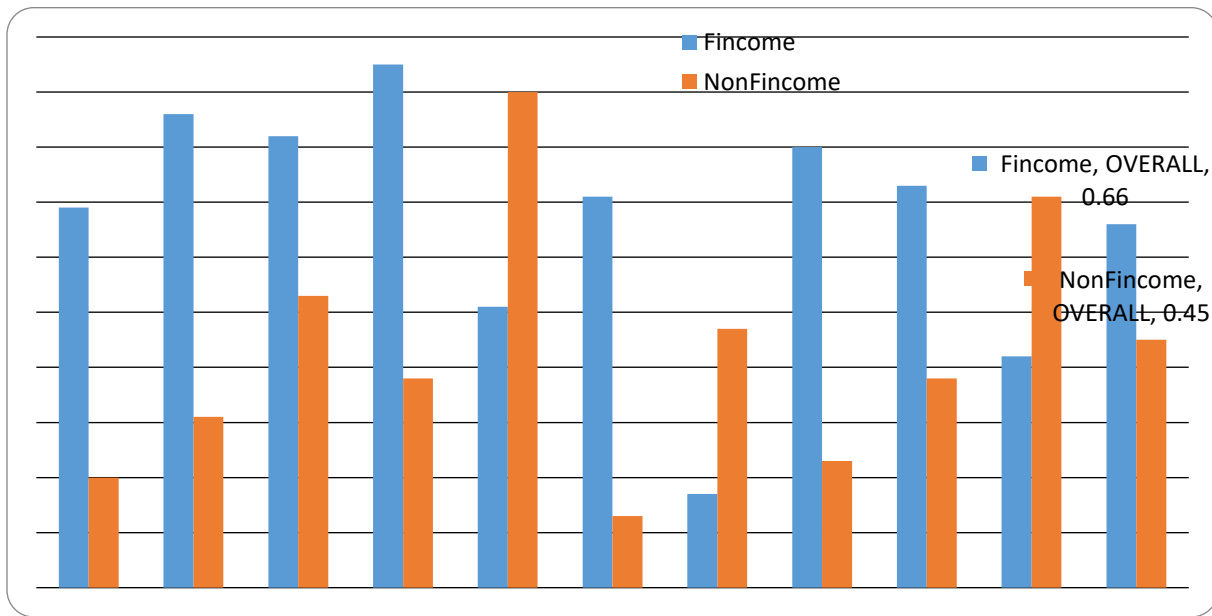

Figure 1 Bar chart showing vulnerability level of the respondents.

Conclusion

This study assessed the vulnerability status of urban farm households in South-South Nigeria using asset capacity approach. The vulnerability of urban farm households is caused by lack of access to formal credit, loss of primary income earner, loss to productive assets, and lack of land for urban farming and low level of education. These indicators undermine the capacity of resource poor households to generate their own livelihood. Hence, they are defenseless, and lack means to cope with damaging loss. Suggesting that urban farm household in the study area are vulnerable to economic shocks. However, this study concludes that increasing urban farm households' productive assets could strengthens household's income generating capacities, thereby ensuring tangible recoveries from economic shocks.

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